



# WW Engineering & Science

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ARCS Program Management Office

U.S. EPA Contract No. 68-W8-0079

EPA Region 5 Records Ctr.



357058

## TRANSMITTAL FORM

Date: September 16, 1993

Attention: Mr. Jeff Groen

Project No.: 04015.23

To: WW Engineering & Science

Client: U.S. EPA

5301 E. River Road, Suite 110

Project Name: Multi-Site Base Closure Support

Minneapolis, MN 55421-1016

Site Name: Wisconsin Steel

Location:

### WE ARE SENDING YOU:

BY: ☐ U.S. Mail ☐ UPS ☒ Federal Express ☐ Other:

ENCLOSED WITH THIS TRANSMITTAL:

UNDER SEPARATE COVER:

<input type="checkbox"/> Work Plan(s)	<input type="checkbox"/> Report(s) (DRAFT) (FINAL)	<input type="checkbox"/> Contract Documents
<input type="checkbox"/> Specifications	<input type="checkbox"/> Design Plans	<input type="checkbox"/> Change Order No.
<input type="checkbox"/> Shop Drawings	<input type="checkbox"/> Proposal(s)	

QUANTITY	DESCRIPTION / DOCUMENT NAME
1	Project Management Plan for Wisconsin Steel - Chicago, IL
1	Site Characterization Interim Report for Wisconsin Steel, Chicago, IL

### THESE ARE TRANSMITTED AS CHECKED BELOW:

<input type="checkbox"/> For Approval	<input type="checkbox"/> For Your Information	<input checked="" type="checkbox"/> For Your Use
<input type="checkbox"/> For File	<input type="checkbox"/> Furnished As Requested	<input type="checkbox"/> As Corrected
<input type="checkbox"/> For Review and Comment	<input type="checkbox"/> Revise and Resubmit	<input type="checkbox"/> For Field Use
<input type="checkbox"/> Rejected	<input type="checkbox"/> _____	<input type="checkbox"/> For Submittal To: _____

### REMARKS:

cc: 04015, 32

BY:

*Theodore A. Lietzke*

Theodore A. Lietzke, Site Project Manager

**RESPONSES TO COMMENTS ON  
DRAFT SCOPE OF WORK  
PHASE II FIELD SAMPLING AND ANALYSIS  
WISCONSIN STEEL WORKS  
CHICAGO, ILLINOIS**

**1.0 ILLINOIS ENVIRONMENTAL PROTECTION AGENCY (IEPA)**

Comment 1. Page 2-1, Paragraph 4: The decision to base background analysis for groundwater on one well nest located in the former parking lot (Fig. 2-1) may not provide appropriate information on groundwater quality for this particular area. Background groundwater analysis will require expansion. This should include additional wells be located in different areas upgradient in relation to this site. This part of the program must take into account groundwater flows, possible impacts on groundwater from surrounding industries and communities, what objectives will the results provide to the investigation, and how is the information to be utilized for risk assessment considerations. Further development into background determinations will be necessary to ensure that proper delineation of contaminants found on-site as compared to background groundwater quality and possible influences of contaminants entering from off-site locations. This would also apply to background evaluation for soils (Also refer to Task 4).

Response 1. In addition to the shallow well located in the former parking lot, we propose that two additional wells installed by the USGS for USEPA under the S.E. Chicago, N.W. Indiana Geographic Enforcement Initiative Study be used for background data. Both of these wells as shown in Enclosure 1, are upgradient of the groundwater flow through the Wisconsin Steel site. The Bright School monitoring well is screened into the shallow sand aquifer and the Trumbull Park well is screened into the fractured dolomite bedrock. Well logs are enclosed with Enclosure 1. Samples collected from these wells for USEPA were analyzed at the CLP Level 4 and the wells are considered suitable to obtain background upgradient data for the Phase 1 study and inclusion into Risk Assessment and an RI Report. Since these wells are upgradient of the site (including the proposed parking lot well), they will reflect impact of surrounding industries and communities.

The objective of the background wells is to determine baseline groundwater quality before it travels into the Wisconsin Steel property and to provide a basis for ascertaining the effect of site fill residuals (slag, steel making residuals, coke plant residuals, other) on that baseline groundwater quality. Since groundwater in the vicinity of the Wisconsin Steel works is not used as potable water supply, risk assessment with respect to groundwater would be focused on potential contaminant release to the Calumet River via groundwater discharge from the shallow sand aquifer and its possible affect on river biota, food chain accumulation, and possible consumption by humans. It is recognized that establishing precise allocations is very difficult due to other industrial (steel making, chemical, waste disposal) discharges to the Calumet River.

Comment 2. Page 2-1, Paragraph 5: The discussion on deep wells to the "top of rock" should be referred to as bedrock. This would alleviate confusion over the intent of the investigation. This should be changed throughout the text to eliminate any confusion or be explicitly understood by the retained Contractor as to the intent of the deep well program during Phase 2 activities.

Also, in this paragraph (and in Figure 2-2) there is discussion on "telescopic well design." It is unclear if this is a proven technology for the mitigation of contamination into stratigraphically dissimilar formations and/or aquifers. Additional information will be required on this drilling method to ensure that it provides the most protective and technically feasible procedure by which to proceed with sampling into the bedrock.

Response 2. Examination of numerous stratigraphic boring records within and in the vicinity of Wisconsin Steel as contained in Enclosure 2 indicate there is little possibility of an aquifer in either the Wadsworth Till or underlying till (Lemont Drift) to the depth of the fractured dolomite. The fractured dolomite can yield water if there is sufficient fracturing of sufficient thickness. A USGS scientist (Robert Kay) states that in order to yield water in this region, the well would need to be screened in the upper 10 feet of the fractured dolomite. If deep monitoring wells are decided to be necessary, we would use 10 foot screens at least 5 feet into the fractured dolomite. At this time, we are proposing only stratigraphic borings with hydropunch or geoprobe sampling of groundwater at the bedrock surface. If organic contaminants are not detected above IEPA Class I Standards, then the boring will be closed. If detected at or above Class I Standards, then deep wells will be installed.

Comment 3. Page 2-1, Paragraph 6: The discussion on "cuttings" will need to be clarified for Phase 2 activities. The handling of investigative derived waste (IDW) should be explicitly understood as to the disposition of IDW during Phase 2 activities. Guidance on IDW has been included for your review and comments. This has been a problem at other sites, therefore this subject should be addressed early in the developmental stage of the Field Sampling Plan (FSP).

Response 3. The contractor will be responsible for disposition of IDW from Phase 2 activities.

Comment 4. Table 2-1, Page 2-2: The table is incorrectly referred to as "Phase III." Please correct the discrepancy. Also, the approximate depths should be included in this table or within the FSP to be prepared by the retained Contractor.

Response 4. Table 2-1 has been corrected, approximate depths of well installations and stratigraphic borings have been added.

Comment 5. Figure 2-1a and 2-1b: These figures appear to include proposed shallow well locations as denoted by the symbol for "proposed deep well locations." This should be corrected to include denotations for the areas inclusive of proposed shallow well locations.

Also, MW-31A and MW-31B locations may not be appropriate for investigation of the Coke Plant Area. MW-31A and MW-31B should be proposed for an area closer to the Calumet River to investigate possible contamination migration downgradient from MW-19.

In addition, the proposed well locations for MW-27A and MW-27B should be relocated closer to the east boundary line of the Slag Area to investigate the possible migration of contaminants from this area into off-site locations.

Response 5. The legend on Table 2-1 has been changed to show locations of investigative borings and potential deep wells, shallow wells in sand, and water table wells. MW 31-A is a water table well purposely placed close to MW-19 for collection of suspected LNAPL. As suggested, an additional shallow groundwater well and deep investigative boring and potential deep well will be located closer to the Calumet River (MW-32A) to investigate possible contamination migration downgradient from MW-19.

Proposed wells MW-27A and stratigraphic boring 27B were located in the vicinity of some small tanks on the property where some petroleum hydrocarbon and PCB contamination were measured during the Phase 1 study (SS-22). This location is also near the property boundary and will serve to track possible contamination off-site.

Comment 6. Task 1, Page 2-8, Paragraph 1: The criteria for selection of soil samples proposed for deep wells should include a contingency. The contingency should be used in the event the selected criteria cannot be met by the proposed methods. This should probably include a pre-selected depth by which a sample will be taken in the event visual or instrumental readings do not give conclusive evidence of contamination. This should also apply to the following paragraph concerning shallow well samples.

Response 6. The following contingency statement has been added. "In the event that visual or instrumental evidence of contamination is not evident in either deep or shallow borings, one sample will be taken from 2 foot depth in fill for confirmatory analysis." ] 2

Comment 7. Task 1, Page 2-8, Paragraph 3: Additional Shelby tube samples should be taken at different locations throughout the site (on and off-site) to properly characterize the permeability of the suspected clay area(s). Shelby tube evaluation should include a grain size analysis along with permeability tests.

Response 7. The contractor has been directed to obtain till shelly tubes from the following six stratigraphic boring (SB) locations for lab permeability tests:

- SB-26B (Slag area)
- SB-30B (Blast furnace area, west side)
- SB-28B (filled slip, steel finishing area)
- SB-16B (blast furnace area, east side)
- SB-31B (Coke plant area)
- SB-32B (Steel production area)

Comment 8. Task 2, Page 2-8, Paragraph 1: The guidance (referenced in Table 2-2) for the determination of Non-Aqueous Phase Liquids (NAPL) does not apply comprehensively to LNAPL. DNAPLs and LNAPLs will exhibit many different characteristics in comparable hydrogeological conditions. The guidance provided (pertaining to DNAPLs) will need to be scrutinized as to what indicators apply to LNAPL properties and what dissimilar characteristics (unique to LNAPLs) will need to be determined by other methods. Also, it is unclear if this section refers to determining the possibility of NAPL(s) existence prior to Phase 2 sampling based on information derived in Phase 1. It would be improbable to determine if NAPL contamination exists in wells that have not been installed (i.e., the 18 additional wells).

It may not be beneficial to draw samples from a static well since many factors may have influenced the contaminants in any one well and thus provide erroneous information. The information provided on samples drawn from a static well will require strict scrutiny as to applicable relationships concerning groundwater conditions at this site. Proper development of existing and projected monitoring wells is probably the preferred sampling procedure in determining tangible contaminate concentrations. Also, the statement concerning other parameters (i.e., PAH's, Cyanide, Phenol, Ammonia-N, and metals, etc.) is not made clear, in the text, as to what sampling event (e.g., unsaturated, vadose, and saturated zones). All of these factors must be taken into consideration when examining the potential existence of contamination in a NAPL state.

Response 8. The following guidance regarding LNAPL has been added to the SOW:

"The Contractor will use an oil interface probe to detect the presence of LNAPL hydrocarbon layer in all wells and sample this layer exclusive of the remaining aqueous Phase 1. The continuous alarm indicates a continuous hydrocarbon layer. The depths and thicknesses of continuous hydrocarbon layer will be determined and recorded. An SOP will be prepared by the contractor for the well sampling including LNAPL and DNAPL detection and sampling.

Phase 1 study has shown the presence of NAPL in 2 wells (MW-5, MW-19) and possibly in others. All of the wells will be checked for NAPL as described above.

There appears to be a consensus of the agencies involved that the till layer is an aquitard and that further installation or sampling of wells in this aquitard will not be beneficial. Therefore, it is proposed that existing till wells will not be sampled during Phase 2. Therefore, static sampling because of very slow recharge in till wells becomes moot. All existing shallow wells and new wells will be purged according to the Phase 1 SOP (Enclosure 3) before

sampling. New wells will also be developed using the SOP from Phase 1 (Enclosure 4). The contractor has been instructed in the SOW to wait 2 to 4 weeks after well development to conduct sampling.

Comment 9. Task 2, Page 2-8, Paragraph 2: It will be necessary to measure groundwater recovery after well development to provide information on recharge rates. This should be outlined in the SOW or the FSP. It should be proposed that a predetermined time interval between well development and sampling be established for field activities.

Also, this section outlines the use of one bailer for all groundwater samples. It would be more beneficial to use a dedicated bailer for each well to ensure that no cross-contamination occurs. It is not clear, from the text, how the bailer would be decontaminated between samples. Please make the appropriate reference to decontamination procedures or outline the procedure in the SOW. However, it is still recommended that a dedicated bailer be utilized for each well and that proper decontamination procedures are followed after each sample is taken from each well to ensure an accurate representation of contamination for all wells.

Response 9. The following statement has been added to the SOW "In-situ permeability testing will be conducted on all new wells using the slug test SOP employed during the Phase 1 Investigation as enclosed." The Contractor has been instructed to wait 2-4 weeks after well development before sampling. The Contractor has been instructed to use dedicated bailers for each well to avoid cross contamination and to use decontamination procedures as employed in the Phase 1 Investigation (i.e., alconox wash followed by tap water rinse, methanol rinse, and 2 de-ionized water rinses).

Comment 10. Table 2-3, Page 2-9: Please define what "MRD" refers under the heading "No. of Field Samples."

Response 10. "MRD" refers to the Corps of Engineers, Missouri River Division, which is the proposed QA Laboratory.

Comment 11. Task 2, Page 2-11, Paragraph 2: Please define "N.T.U." in the Glossary or this section of the text.

Response 11. N.T.U. has been defined in parentheses (i.e., Nephelometric Turbidity Units).

Comment 12. Task 2, Page 2-11, Paragraph 5: The evaluation of "well to dryness," as referred in this section, is unclear. There is no summary on how this determination will be completed. Please clarify the text. Also, there are multiple grammatical errors in this paragraph.

Proper well development and related sampling appears to be of great concern throughout the text for the Phase 2 investigation. Proper sampling procedures will require explicit clarification to ensure that an accurate representation of contamination can be achieved for this site. This concern will require additional examination.

Response 12. During the Phase 1 study, the permeability of the till wells was so low that recharge took weeks or months to occur after purging. Therefore, these wells had to be evacuated to dryness during sampling. There is agreement that further sampling from till wells will not be beneficial during Phase 2 investigations. The contractor will develop a detailed SOP for well sampling to be approved by the agencies (IEPA, U.S. EPA, COE).

Comment 13. Task 3, Page 2-11, Paragraph 1: There is a reference to a summary of "hot spots" in this section, however there is no summary. There is a reference to Figure 2-3, but this information only pertains to the postulated locations of "hot spots" and not a summary. Please provide the information in this section or make the appropriate reference (appears to be Table 2-7) to where this summary may be found in this text.

Response 13. As suggested, Table 2-7 which contains the summary information has been referenced.

Comment 14. Task 3, Page 2-11, Paragraph 4: The reference to no QA/QC requirements on field screening activities concerning "hot spots" is inappropriate. It is important to conduct QA/QC on field screening data to ensure an accurate depiction of "boundary" areas and instrument results. Because the Data Quality Objective (DQO) of field screening results are so diminutive (Level II), it is of the utmost importance to ensure that these samples are not providing erroneous information. This is especially true since it appears that field screening results will be the driving factor in decisions on confirmatory samples and the placement of additional sampling locations. Because of the nature of field screening activities there is an equal (if not greater) possibility for cross-contamination of equipment and/or samples than with Level IV data acquisition. Therefore a QA/QC program should be tasked to the Contractor for inclusion in the FSP to ensure Phase 2 field screening data is considered valid. This is not to say provide QA/QC samples on field screening results conducted at a DQO of Level IV (the confirmatory samples will provide this level), but IEPA recommends that a cross reference program be implemented to provide QA/QC on field instrumentation and screening results. This program can be completed in various manners and should be discussed for development in the FSP.

Response 14. As recommended, there is a need for QA/QC on field screening. The Contractor has been required to provide SOPs for each piece of equipment used in field screening. This will involve description of daily instrument calibration, operation, confirmation of reproducibility, and inclusion of confirmatory laboratory samples. Table 2-7 listed the numbers and locations of confirmatory samples. The Contractor has been required to correlate instrument contaminant screening levels with confirmatory samples taken at the same locations. Equipment operation and calibration manuals must be included in SOPs.

Comment 15. Task 4, Page 2-12, Paragraph 2: The discussion on boreholes being "refilled" will require additional evaluation. Proper abandonment of the proposed boreholes will require that specific guidelines be outlined in the FSP on procedures to conduct this activity. This requirement also relates to field activities on-site. Also, it appears that this entire task is duplicated on page 2-21.

Response 15. The following procedures have been specified for abandonment of boreholes and follow EDPH code for borehole abandonment and will constitute an SOP.

1. Mix neat cement slurry (5 gal. water per 94 lb. bag cement).
2. Insert tremi pipe (1" i.d. pvc) into augers and extend to bottom.
3. Slowly pump slurry under low pressure through tremi pipe.
4. Continue slow pumping until all formation water and the water slurry mix is displaced from top of casing.
5. Slowly withdraw tremi pipe - making sure bottom of pipe remains below pure slurry.
6. Pull a flight of augers (5' if in unstable materials and hole collapse is likely or 10' if in competent material and collapse is unlikely).
7. Top off cement slurry after each flight is removed.

Comment 16. Task 5, Page 2-12: There should be a reference for modifications to be incorporated into the HSP concerning this activity. This task may pose unforeseen problems associated with both sampling protocol and personnel safety. This task should be completely evaluated prior to implementation, so that no delays will be encountered in field activities.

Response 16. The Contractor has been directed to make appropriate modifications/additions to their HSP to cover the potential risks associated with this task. We expect that Level C at least with possible Level B if confined space.

Comment 17. There is no page 2-22 in this document.

Response 17. Page 2-22 is Figure 2-5 showing locations of storm basins, conduits, and outfalls.

Comment 18. Task 6, Page 2-26, Paragraph 4: As in Task 1, there should be a contingency to include samples for laboratory analyses in the event that visual or instrumental readings are inconclusive.

Response 18. The following statement has been added to the SOW: "In the event that instrumental readings are low or inconclusive and there is no visual observation of contamination, samples will be taken from the 2.5 and 5 foot depths."

Comment 19. Task 7, Page 2-26: What is the justification on doing TCLP for metals only in the Slag area? What justification is there for doing 6 total TCLP in the Slag area? Is this representative of the Slag area? What is the justification for using a composite sample for all the proposed TCLP analyses? What is the purpose of TCLP analysis in this Phase of the project? What will the information be used for? Why were these areas selected? Why were other area excluded from TCLP analyses. Are additional TCLP analyses in these area (or other areas) anticipated at a later date? For samples (other than the Slag area) why were the parameters chosen as referenced in Table 2-13. Also, Table 2-13 does not provide units by which concentrations are measured.

TCLP analyses is used to derive many ARAR's at various sites in Illinois. TCLP analyses is also required on removal actions involving RCRA hazardous waste. If material is anticipated to be remediated or manipulated in a manner requiring TCLP analyses, this phase of the project could conceivably satisfy TCLP requirements. Further evaluation into the requirements regarding TCLP analyses should be examined.

Response 19. By its nature, slag is a by product of a high temperature process wherein there is complete destruction of organics, therefore, only metals TCLP testing is proposed. Composite samples should be more representative of the slag mass. We believe three composite samples of unweathered slag and three composite samples of weathered slag should be adequate representations of the slag mass.

During the Phase 1 investigation TCLP tests were conducted on ~15 sediment/waste samples from pits and foundations. High levels of contamination found in sediment samples from three waste lagoons south of Mill 6 and a former precipitator foundation in the steel production area suggest that these materials should also be tested for TCLP characteristics. Table 2-13 is the official list of TCLP parameters as published in CFR Part 40. Units are mg/l.

In the event that early action cleanup of highly contaminated areas (i.e., pits, foundations, lagoons) as recommended in the Buffalo District's Interim Report is conducted, TCLP test results will provide guidance on acceptable cleanup/disposal methods.

Comment 20. Figure 2-6b: It is unclear how this figure pertains to the SOW. It is not referenced in the text.

Response 20. Figure 2-6b shows the location for one of the proposed background sediment sampling locations north of the Wisconsin Steel property. It could not be shown on Figure 2-6a.

Comment 21. Task 8, Page 2-32: It is difficult to follow the intent of the proposed "pumping tests" as outlined in the SOW. In theory, this task may provide additional information on hydraulic properties of the Carmi sands by examining drawdown effects. However, the approach presented in the SOW is ambiguous in defining specific objectives of the pumping tests, by what methods and assumptions will the test will be performed and how will the information be interpreted, given what is and is not known about hydrogeological conditions at this site.

Another factor (not considered in this proposal) is the possible influences on contaminants by the pumping affects of this test. Indiscriminate pumping may manipulate chemicals into areas not previously contaminated or unduly cause a temporary flux in contaminate concentrations at wells located within the proximity of the pumping tests. Also, the requirements necessary to meet applicable regulations for discharge of groundwater from an area known to contain contaminants may not be technically feasible at this time. Further evaluation of this proposal will be required regarding this task of the Phase 2 proposal.

Response 21. At the IEPA/USEPA, COE, Navistar meeting held at Region V office on May 13, 1994, it was agreed that pump tests would not be beneficial or advisable at this time. Therefore, pump tests will be eliminated from the Phase 2 Investigation.

### SECTION 3.0 - SAMPLING

Comment 22. Subsection 3.5, CE 301-399 (organic), Page 3-10: The proposal to identify VOA samples with only one tag may be inappropriate. VOA samples should be tagged individual to ensure that if a vial is damaged during handling or shipping, analyses on all the affiliated vials will not be compromised.

Response 22. The SOW has been changed to require tagging of each individual VOA vial.

Comment 23. Figure 3-6, Page 3-12: The reference to samples being sealed in metal paint cans for shipment may be inappropriate. A more suitable packaging device may be necessary to ensure compliance with current shipping requirements. Also refer to Figure 3-8.

Response 23. Reference to paint cans has been dropped. Instead, double bagging will be required for medium level samples.

Comment 24. Figure 3-8, Page 3-16: Shipping requirements will need to be reviewed to ensure that the shipping company transporting samples is given the appropriate information on material being shipped. Many shipping companies today require specific information on the material being transported by them and subsequently require special handling guidelines for particular materials to ensure their worker's safety. This must be taken into consideration during FSP development to circumvent any delays during field activities.

Response 24. The following has been added to Figure 3-8:

"\* Shippers must be notified of the nature and probable levels of contamination in samples to be shipped."

### SECTION 5.0 - QUALITY ASSURANCE PROJECT PLAN

Comment 25. A copy of the draft Quality Assurance Project Plan (QAPP) currently being utilized by the Pre-Notice program at IEPA has been included for review and comments on the applicability of it in the proposed FSP. If a copy of the USEPA QAPP guidance is needed please let the Agency know and a copy will be provided to you.

Response 25. We have used both the IEPA and USEPA referenced documents in preparation of contractor requirements for preparation of his FSP for the Phase 2 study.

### SECTION 7.0 - SCHEDULES AND REPORTING REQUIREMENTS

Comment 26. Page 7-1, Paragraph 2: It appears that the schedule outlines a date of 21 days to review the SOW, compile draft documents of the FSP, QAPP, HSP and submit them for comments to the Corps of Engineers. This date may not allow for an appropriate response from the contractor. If this SOW is to be supplied to the contractor in a suitable amount of time, prior to the notice to proceed, then this schedule may be applicable. However, it is not clear by the text if the contractor will have a sufficient period by which to review the SOW.

Also, it is unclear as to what review schedule the submitted draft FSP, QAPP, and HSP will be subjected. It is important to have an acceptable amount of time for review, revisions, submittal, and resubmittal of documentation, to assure an amicable progression of events.



Response 26. The proposed contractor (ARDL) conducted the Phase 1 study at the Wisconsin Steel site and prepared an FSP, QAPP, and HSP at that time. The contractor (ARDL) is certified for CLP work and is highly familiarized with requirements for the FSP and QAPP. With the detailed guidance we have provided in Sections 3.0 to 6.0 of the SOW, we believe the contractor can prepare good draft documents for the Phase 2 study in the allotted time.

#### GENERAL COMMENTS

Comment 27. There is a concern over classification for groundwater at this site. It has been expressed by the Corps of Engineers that this site is to be considered Class II groundwater. It is unclear how this was determined. It is important to remember that groundwater classification, as it pertains to Illinois Groundwater Protection Act, is governed by the yield of the system and not by groundwater quality. If the appropriate reference could be supplied as to what information was utilized to determine Class II categorization, it would be appreciated. A copy of the IGPA, Section 620 regulations has been included for your review.

Response 27. We have examined the criteria for groundwater classification under Section 620 of the IGPA. One of the requirements for a Class 1 (potable) classification is that the groundwater be located 10 feet or more below the land surface. At the Wisconsin Steel site, groundwater is often within 5 to 10 feet of the ground surface. Without the extensive often contaminated fill, groundwater would be at the surface. The Carmi sand aquifer therefore must be considered a Class II general resource groundwater. A letter will be sent to IEPA under separate cover requesting concurrence on this matter. The underlying deep aquifer in the silurian limestone is probably a Class I potable resource groundwater. The intervening Lemont drift and/or Wadsworth tills are aquitards or non-aquifers.

Comment 28. It is difficult to follow the text and the corresponding figures and tables within the text. It may be necessary to place all figures and tables in separate sections. Also, on some of the figures it is nearly impossible to interpret approximate locations outlining the proximally for additional work. The figures should be elucidated, so that the contractor will have a more definitive interpretation on the intent of the SOW figures.

Response 28. As suggested, we will place all figures and tables in separate sections and try to upgrade the figures. A USACE representative will be on site at all times during the field work to clear up any problems with interpretation.

Comment 29. Page 7-3 provides a list of references utilized in the creation of the SOW. It also appears that reproductions were extracted from the reference documents and only the page, figure, drawing, and table numbers changed to comply with the SOW. It is very unusual for the Agency to receive a document with such a diminutive amount of original work completed by the author. It is the Agency's understanding that this document is to be utilized as a guideline and bidding mechanism for contractors to submit a FSP, QAPP, and HSP. It may be advantageous to simply reference the material and supply text on how the Corps of Engineers requires the material be utilized in the contractor's draft documents. Most environmental have or have access to all the referenced material. It is more important to have the contractor understand how and why the material is to be incorporated into the FSP, QAPP, or HSP.

Response 29. Section 3 to 5 of the SOW have been prepared to guide the Contractor in preparation of a site specific FSP and QAPP. As you stated, the Contractor has or should acquire all of the listed references for guidance in their preparation. As stated previously, the proposed Contractor has an HSP for this site and needs only to update this HSP to accommodate the work to be performed.

**RESPONSES TO COMMENTS ON  
DRAFT SCOPE OF WORK  
PHASE II FIELD SAMPLING AND ANALYSIS  
WISCONSIN STEEL WORKS  
CHICAGO, ILLINOIS**

**2.0 USEPA - REGION V**

**GENERAL COMMENTS**

Comment 1. A technical meeting conducted with members of the Corps, the U.S. EPA, and the IEPA on December 8, 1993, included a discussion on the characterization of waste as hazardous or non-hazardous. The meeting also included discussion on appropriate protocols for analysis and disposal of these materials. The SOW does not address the issue of hazardous or special waste. The task of waste characterization may be planned by the Corps to be handled separately. However, the current SOW should acknowledge the issues of waste handling and analysis protocols.

Response 1. We acknowledge that at the December 8, 1993 meeting the subject of waste characterization and protocols for analysis and disposal primarily as RCRA listed waste or other characteristic hazardous waste (flammability, ignitability, corrosivity, etc.) was discussed. We plan to handle this issue separately in conjunction with clean-up and disposal. However, we have conducted TCLP tests on ~ 15 sediment/waste samples during Phase 1 and plan to conduct TCLP tests on slag, lagoon sludge and precipitator sludge to assist in waste characterization and developing treatment and disposal plans.

Comment 2. No discussion of previously-existing on-site water wells was included in the Sampling Plan. Field verification of previously-existing water wells on the WSW site is recommended. Additionally, supplemental information from on-site and off-site water well logs may be available via a records search and would greatly increase understanding of the site's potential off-site impact.

Response 2. We have done considerable search of well and boring log records on and in the vicinity of Wisconsin Steel. There are no records of water wells on the site. It is highly likely that all process water was obtained from the Calumet River. We have extensive information on stratigraphic borings on and in the vicinity of the property which will be used for planning locations of additional borings and wells and for hydro-geologic site evaluation.

Comment 3. A geophysical investigation should be considered to delineate the old North Slip as well as to determine the depth of the three slips' sheet pilings. Such an investigation could be incorporated into the upcoming field work.

Response 3. We believe we can accurately locate the old slip boundaries from existing records. We are also obtaining information on the depths of sheet pilings from old records.

Comment 4. No soil borings or monitoring wells appear to have been placed in the vicinity of the steel "pickling" area (acid bath to strip steel prior to plating); the pickling area was approximately 500 feet northeast of the guard house on 106th Street. Has this possible caustic acid contamination been considered as an area of environmental concern? U.S. EPA recommends that this area be investigated during the upcoming field work.

Response 4. The pickling area was approximately 500 feet southeast of guardhouse in the vicinity of MW-10 and SB-11. pH measurements taken from these borings and throughout the entire property generally showed neutral

to basic pH's between 7.5 to 10.5. The large amount of basic slag and natural high pH's of soil materials in this area make it highly unlikely that any acid contamination exists on the property - acidity is simply not a problem.

Comment 5. Although the Sampling Plan proposes that seven new water table monitoring wells be completed on the site, U.S. EPA recommends that 12 new water table monitoring wells be installed. In particular, we recommend that three wells be placed in the Coke Plant area rather than one; one water table well should be placed adjacent to MW-16B (unless existing MW-16 can be documented as intersecting the Carmi Sand's water table) and one water table well should be placed adjacent to MW-28 (unless existing MW-11 can be documented as intersecting the Carmi Sand's water table). An additional water table well should also be placed adjacent to SB-17 in the slag area.

Proposed monitoring wells MW-31A and MW-32A appear to be located very close to previously-installed MW-5 and MW-19 where free-floating product is suspected. We recommend that in addition to MW-31A a water table well be placed very near MW-19 and a second well be placed to the east toward SB-01. These additional wells will provide better local hydraulic information and will be useful in determining the potential extent of any light non-aqueous phase liquids (LNAPLs). Well MW-32A should be installed within 25 feet of MW-05 to assess the potential for LNAPLs.

Response 5. Actually, only four of the proposed new 7 shallow sand wells were to be water-table wells (MW-30A, MW-32A, MW-31A, MW-29A). There is no indication to believe that LNAPL would occur in MW-26A, MW-27A, or MW-33A. However, if U.S. EPA and IEPA desires, we can make all of the shallow wells water table wells.

We have since determined that MW-5, installed previously, is a water table well with LNAPL precluding the need for proposed well 32A at that location.

We agree that an additional three water table wells should be placed in the coke plant area and one in the vicinity of MW-16B since MW-16 is not a water table well. The locations of these additional four wells are shown in revised Figure 2-1 as MW-16A, MW-32A, MW-34A, and MW-36A.

A shallow water table well will also be placed in the filled north slip (MW-28A) as suggested, we believe there is very little likelihood of LNAPL in the slag area and therefore, no need for a water table well in the vicinity of SB-17.

MW-31A is to be placed very near to MW-19 which has evidence of LNAPL. In addition as suggested, an additional water table well (32-A) will be placed between MW-19 and SB-01 to provide better hydraulic information and be useful in determining the extent of LNAPL contamination. Since MW-05 has been determined to be a water table well, there is no need to locate MW-32A there. MW 32-A location has been moved between MW-19 and SB-01 as previously discussed.

Comment 6. U.S. EPA requests that the SOP for the investigation of units beneath the Wadsworth Till be submitted for review before the investigation commences. Our chief concern regarding the sampling and analysis of these deeper geologic units is the possibility of cross-contamination via the bore-hole conduit. If contamination is observed in the surficial units, then double-casing of the deeper monitoring wells, or its equivalent, may be necessary to prevent such cross-contamination.

Response 6. Contamination of the upper sand aquifer has been confirmed during the Phase 1 Investigation. Therefore, care will be taken to prevent cross contamination during the Phase 2 Investigation. At this point, we are suggesting that at the nine locations previously proposed for deep monitoring wells, stratigraphy borings be placed first without well placement. Water samples would be taken from the aquifer in or near the bedrock surface by hydropunch or other suitable method. Organic contamination (volatiles/semi-volatiles) would be measured and if detected above Illinois Class I Ground Water Standards, permanent wells would be placed also during Phase 2

investigation. If organic contaminants are not detected above Class I standards, then the bore holes will be closed and sealed without monitoring well installations.

The contractor has been required in the SOW to submit SOP's for prevention of aquifer cross contamination during deep investigatory borings or deep well placements. The agencies (IEPA, U.S. EPA, COE) will review and approve these SOP's before borings or installations are done. We recognize that double casing may be required.

Comment 7. Although sampling of dense non-aqueous phase liquids (DNAPLs) has been proposed for the upcoming Phase II field work, no definitive plan has been presented within this Sampling Plan for DNAPL delineation. Such a pre-determined plan or approach is strongly recommended, especially for the Coke Plant area.

Response 7. Although there was confirmation of LNAPL on the site during Phase 1, especially in the coke plant area, we do not expect to find significant DNAPL. However, the contractor has been directed to prepare SOP's for detection and sampling of both LNAPL and DNAPL for his FSP. These SOP's must be reviewed and approved by the agencies (IEPA, U.S. EPA, COE) before field work commences.

Comment 8. Although sampling of metals has been proposed for the upcoming Phase II field work, consideration should be given to sampling the full metal scan of the Target Analyte List for a percentage of the samples.

Response 8. The Phase 1 Investigation revealed the major metal contaminants which are to be included in the Phase 2 Investigation. For verification we will include the complete TAL list on 10% of groundwater and soil samples from investigative borings. This will not apply to hot spot screening.

Comment 9. A global check for typographical errors should be made.

Response 9. A "global" check has been made for typographical errors (oops).

#### SPECIFIC COMMENTS:

#### 2.0 TASK DESCRIPTIONS

Comment 1. Page 2-1, Task 1, 1st Complete Paragraph: The SOW needs to specifically identify screen placement for the deep monitoring wells which are currently listed as being "at the top of bedrock." If ground water is not observed on the "top of bedrock," then the deep wells should be set in the lowest perched zone below the Wadsworth Till. The borings for these wells should penetrate into bedrock to determine depth and condition of bedrock surface (lithology, fracture, etc.).

Response 1. As stated previously, we now propose to do stratigraphic borings and hydropunch sampling to determine the need for deep well placement. Examination of numerous boring logs on and in the vicinity of Wisconsin Steel strongly suggest that the Lemont drift and Wadsworth Till overlying the silurian limestone will not yield water and that well screens if placed would need to be in the fractured limestone to yield water. As you suggest, the contractor has been directed to bore at least 5 feet into the fractured limestone for stratigraphic borings and deep well placement if they are needed. Depths and condition of bedrock surface (lithology, fracture) will be described.

Comment 2. Page 2-1, Task 1, 2nd Complete Paragraph: Although 10 deep monitoring wells are listed, only nine are identified on Table 2-1 and Figure 2-1. Although eight water table monitoring wells are listed, only seven are identified on Table 2-1 and Figure 2-1.

Response 2. As described earlier (General Comment's Response 5), we now propose to install a total of seven shallow water table wells and three other shallow wells which could be water table wells, if the agencies desire

(otherwise entirely in saturated sand). The previously proposed nine (not 10) deep wells will become stratigraphic borings and deep wells installed only if organic contamination is detected.

Comment 3. Page 2-1, Task 1, 4th Complete Paragraph: By "in-place" well, do you mean an existing monitoring well?

Response 3. The term "in-place" well refers to existing monitoring wells.

Comment 4. Page 2-8, Task 1, 1st Complete Paragraph: The Wadsworth Till is listed as possibly being sampled for contaminant concentrations. U.S. EPA recommends that units beneath this till aquitard be sampled, rather than the aquitard itself. We also recommend that fill and sand samples be selected based on the highest visual or instrument indication of contamination.

Response 4. Agree. We do not propose to sample the Wadsworth Till aquitard. Fill and sand samples will be selected based on the highest visual or instrument indication of contamination.

Comment 5. Page 2-8, Task 1, 2nd Complete Paragraph: U.S. EPA recommends that fill and sand samples be selected based on the highest visual or instrument indication of contamination.

Response 5. Agree. We do not propose to sample the Wadsworth Till aquitard. Fill and sand samples will be selected based on the highest visual or instrument indication of contamination.

Comment 6. Page 2-8, Task 1, 3rd Complete Paragraph: U.S. EPA also recommends that a third Shelby Tube sample be collected for permeability tests from the Wadsworth Till (MW-31B) within the Coke Plant area.

Response 6. A total of six Shelby Tubes from till will be taken: 1 from slag area; 2 from blast furnace area (west & east side); 1 from filled slip-steel finishing area; 1 from coke plant area; and 1 from steel production area.

Comment 7. Page 2-8, Task 2, 5th Completed Paragraph: Although elevation measurements are listed within the Sampling Plan with a precision of 0.1 inch, we recommend that the precision be 0.01 feet. (Both units are similar, but the industry standard is 0.01 feet.)

Depending on the depth to ground water within the deep monitoring wells, hand-bailing of the wells may be a relatively difficult task. The Corps may wish to consider alternative sampling methods.

Response 7. Precision has been changed to 0.01 feet. If deep wells are installed, the contractor may use a suitable pump which does not introduce air or contamination. The type of pump must be approved by the agencies (IEPA, U.S. EPA, COE). This wording has been added to SOW.

Comment 8. Page 2-11, Task 2, 5th Purging Procedure: What is meant by "but fast enough that the recharging water will not cascade down the inside of the casing?"

Response 8. This means that the well should not be purged to the extent that water runs down or "cascades" rapidly down the well screen which would tend to introduce excessive turbidity.

Comment 9. Page 2-11, Task 3, 7th Complete Paragraph: A significant range of investigation methods is left open to the Contractor's discretion during the field work for the hot spot demarcation and sampling. However, none of the methods listed is described in sufficient detail to provide technical comments. Please provide such detail.

Response 9. It was the intent for the contractor to provide details on the investigative method in work plans for agency review and approval. As a result of the May 13 meeting in which Navistar consultant (ERM) suggested a more detailed radial sampling and screening approach, this approach has been incorporated into the SOW.

Comment 10. Page 2-11, Task 3, 9th Complete Paragraph: QA/QC samples are necessary to validate data accuracy. If, however, the hot spot demarcation is considered a qualitative rather than quantitative investigation, then data validation may not be necessary. U.S. EPA recommends that standard QA/QC protocol be followed.

Response 10. The statement regarding, no need for QA/QC samples has been removed from the SOW. The contractor has been required to run QA/QC on ~20% of confirmatory samples.

Comment 11. Page 2-11, Task 3, Last Paragraph: Although the investigation of "hot spots" is designed to characterize contamination within the unsaturated zone above the Carmi Sand Aquifer and the aquifer, itself, the Wadsworth Till must be partially penetrated to determine the existence of DNAPLs. Hence, borings may terminate in the till unit.

Response 11. Agree. The contractor has been directed to bore into the top 1 to 2 feet of till if field screening indicates the possible presence of DNAPL.

Comment 12. Page 2-19, Task 3, Table 2-7: TPH and BTEX analysis should also be completed in the vicinity of the discarded tanks in the Slag Area.

Response 12. TPH and BTEX have been added.

Comment 13. Page 2-12, Task 4, 3rd Complete Paragraph: Although Figure 2-4 is referenced as illustrating candidate locations for background sampling, the figure only includes a topographic map with no specifically-marked areas. Please propose specific locations.

Response 13. The contractor is to suggest specific locations in his FSP. Figure 2-4 was intended only to show schoolyards, cemeteries, parks, etc. as candidate locations. At the May 13 meeting, it was also agreed that the background locations should contain some fill, such as slag which is typical of the area. Wording to this effect has been added to SOW.

Comment 14. Page 2-12, Task 5, 6th Complete Paragraph: Although Figure 2-5 illustrates the locations of storm basins, outfalls, and manholes, a 1928 Plat Map of the WSW water piping, sewers, etc., indicates that at least 4 and possibly 5 outfall locations may have been missed. Based on the Plat Map an outfall exists between A-10 and A-5 (the outfall was a previous "pump house" intake, so it may be submerged), another appears to exist north of A-11 (the outfall was another previous intake, so it may be submerged), two outfalls appear to exist south of A-11, and another may exist along the North Slip, directly north of the former "tar storage" tank within the coke plant area.

Response 14. A field examination has only confirmed the presence of outfalls as shown in Figure 2-5. If other outfalls are found arrangements will be made to sample them.

Comment 15. Page 2-12, Task 5, 8th Complete Paragraph: The proposed tracer study may provide valuable information regarding the "short-cutting" effects of the utility conduits on ground water flow within the Carmi Sand. A copy of the tracer plan should be made available for regulatory technical review before implementation.

Response 15. The tracer plan prepared by the contractor will be subject to review and approval by the agencies (IEPA, U.S. EPA, COE).

Comment 16. Page 2-21, Task 5, Entire Page: The text of this page is identical to the bottom of page 2-12, except for the QA/QC requirements, which have been deleted. This page may be omitted from the Sampling Plan.

Response 16. This page is identical to 2-12 and has been eliminated.

Comment 17. Page 2-26, Task 6, 3rd Complete Paragraph: What sampling method will be used to collect river and slip sediment? Collecting representative samples can be difficult at times. We suggest that the Corps provide more guidance to the contractor on this task.

Response 17. We have suggested the use of vibracore sampling which has worked well on other Great Lakes sediment sampling programs. We will send information on vibracore sampling and require the contractor to prepare an SOP for core sampling in the Calumet River and slips.

Comment 18. Page 2-26, Task 6, 4th Complete Paragraph: Although OVA or HNU field screening is applicable to petroleum and other hydrocarbon-related contaminants, the majority of the contaminants anticipated in the river and slip sediments are metals, semi-volatile organic compounds (such as PAHs), and perhaps cyanide. Alternative field-screening methods should be investigated.

Response 18. We have suggested that the contractor also consider other field screening techniques such as X-ray fluorescence for heavy metals and field kits for PCB screening. We expect considerable visual and instrumental indication of historical contamination in river/slip sediment cores.

Comment 19. Page 2-26, Task 7, 5th Complete Paragraph: Although 3 sample locations are indicated in the text of this paragraph, Figure 2-8 illustrates only 2 sampling locations. Please revise the figure. (The figure is very difficult to read at its present scale.)

How will the weathered and the unweathered slag be distinguished?

Response 19. An additional location has been shown on Figure 2-8. The on-site Buffalo District Project Engineer will assist in identifying exact field locations and weathered versus unweathered slag.

Comment 20. Page 2-31, Task 7, Table 2-13: This table should specify units (ie., mg/L).

Response 20. Units are specified in table (mg/l).

Comment 21. Page 2-32, Task 8, 1st Complete Paragraph: The first sentence is missing an object. "Two wells shall be constructed in..." what?

The pumping and observation wells proposed in this section (Task 8) should also be referenced in the Task 1 well installation section, as well as illustrated on Figure 2-1b.

Typically, an effective pump test requires the existence of a monitoring well within 5 to 10 feet of the pumping well, in addition to monitoring wells at greater distances (such as 50 feet).

Will the pumping wells be used as monitoring wells after the pump tests are completed? (The referenced ASTM guidance is designed for monitoring wells rather than standard recovery wells.)

Response 21. At the May 13 meeting, the agencies agreed that pump tests would not be useful for the Phase 2 Investigations, thus these comments are not addressed.

Comment 22. Page 2-35, Task 8, 1st Complete Paragraph: Will all water pumped from the wells be containerized, sampled, analyzed, and disposed of properly? Will the storage drums or tanks also be properly labeled?

Response 22. At the May 13 meeting, the agencies agreed that pump tests would not be useful for the Phase 2 Investigations, thus these comments are not addressed.

Comment 23. Page 2-35, Task 8, Last Paragraph: The last line of this page (2-35) does not correspond with the first line of the next page (2-36).

Response 23. At the May 13 meeting, the agencies agreed that pump tests would not be useful for the Phase II Investigations, thus these comments are not addressed.

Comment 24. Page 5-1, Section 5, Contents within the QAPP: Please add the following:

- sensitivity as a quality assurance objective to Item 2;
- final evidence file custody procedure to Item 4;
- field screening analytical protocol to Item 7.

Response 24. The items mentioned have been added as requirements for the contractor QAPP submittal.



**RESPONSES TO COMMENTS ON  
DRAFT SCOPE OF WORK  
PHASE II FIELD SAMPLING AND ANALYSIS  
WISCONSIN STEEL WORKS  
CHICAGO, ILLINOIS**

**3.0 NAVISTAR (ERM)**

**Task 1 - Monitoring Well Installation**

Comment 1. The text of the SOW states that ten deep and eight shallow wells will be installed during the Phase II activities. However, Table 2-1 and Figures 2-1a and 2-1b list only nine deep and seven shallow wells. This discrepancy should be clarified.

Response 1. The text was in error. Originally, there were nine new deep wells and seven new shallow wells proposed. As a result of the recommendations made by ERM and discussions at the May 13 Chicago meeting, we are now proposing that deep stratigraphic borings first be made at the nine locations proposed for deep wells and groundwater at the interface of the fractured limestone rock and overlying till be sampled. If organics are not detected above Illinois Class I Groundwater Standards, then deep wells would not be installed. If found at or above the standard, deep wells would be installed at those locations exceeding the standards.

As a result of ERM and agency recommendations, we have increased the number of shallow wells to a total of 12 as shown in Figure 2-1 and listed in Table 2-1.

Comment 2. Many of the soil samples proposed during the Phase II remedial investigation are located below the water table. The analytical results from these samples will be ambiguous since the results may be more reflective of ground water chemistry than soil chemistry. Additionally, as drilling proceeds downward through saturated soils, the possibility of cross contamination increases and can result in an inaccurate characterization of soil contamination. Therefore, we believe that any soil samples collected below the water table should be used for stratigraphic purposes only.

Response 2. We do not agree. Many metals and organics are strongly adsorbed to or contained within the ion exchange lattice of soils below the water table and do not readily release to groundwater (i.e., the chemical equilibrium is highly biased toward the solid soil phase and not into the dissolved water phase. In order to explain the absolute types and amounts of contaminants and potential for long term release to groundwater, it is necessary to measure contamination on the soil/waste in the saturated and unsaturated environment.

Comment 3. We recommend that the shallow wells proposed in the Phase II SOW be relocated to provide the maximum amount of data. For example, many of the sand wells proposed in the SOW are in proximity to existing wells (for example, MW-32 and MW-31). Accordingly, these provide little additional data for the additional expense. The well locations which ERM proposes are shown on Figures 1 and 1A. The rationale for these locations is as follows:

The location of MW-26 as proposed by ERM is downgradient of the current wells in the slag area. This location concurs with MW-27 as proposed in the SOW. This well provides control on the southern side of the slag area in which there currently is a data gap.

The monitoring wells MW-27 through MW-31 as proposed by ERM are located in the area with the highest probability for contamination, the former Coke Plant area. The proposed locations for MW-27 and MW-28 as

proposed by ERM are located along the Calumet River directly downgradient of the suspected contamination. When used in conjunction with MW-19, these wells should intercept any contaminant plume in that area.

MW-29 and MW-30 are located upgradient of the area suspected to have the greatest potential for ground water contamination. These locations should provide better information regarding the upgradient ground water chemistry than the far upgradient shallow wells (MW-04, MW-20, and MW-05). MW-31 is located in the approximate center of the Coke Plant area and will be used to determine the magnitude of the contamination and to determine if a NAPL is present.

Because this area is adjacent to the Calumet River and is bordered on the north and south by barge slips, ground water flow direction in this area may be complex. The increased number of monitoring wells should add confidence to future piezometric surface maps and remedial efforts.

The background monitoring well proposed by ERM (MW-32) is at the same location as MW-33 as proposed in the SOW. The analytical results of this well will be used for comparison purposes with the data from onsite wells. This well will also be used as an additional data point for ground water flow contour maps.

Response 3. It is true that some of the wells proposed in Phase II (MW-31A, B; MW-32A, B) are in very close proximity to existing wells, this was done intentionally because there was evidence of high contamination and NAPL at these locations. Water table wells and stratigraphic borings (and possibly deep wells) are most apt to confirm the presence of NAPL if placed at these locations. We have since determined that since existing Well No. 5 is a water table well, Well 32A is not needed at this location. U.S. EPA has suggested a water table well between MW-19 and SB-01 and MW-32A has been shifted to that location as shown in revised Figure 2.

The proposed location for COE MW-27A was incorrectly shown in the draft SOW. The correct location for this proposed shallow well is shown in revised Figure 2. We propose a stratigraphic boring (SB-27B) at your location MW-26. Our relocated MW-32A and MW-36A will provide the downgradient information as recommended by your wells MW-27 and MW-28. Our new shallow water table well placements MW-34A and MW-35A will serve the purposes of your MW-29, MW-30, and MW-31, in determining the magnitude of contamination and presence of NAPL in the Coke Plant area. We should point out that the most contaminated groundwater from Phase I was from MW-05 and that MW-04 and MW-10 also showed high levels of contamination and are therefore not upgradient from contaminated plant areas.

The increased number of shallow monitoring wells in the Coke Plant area should, as you suggest, add confidence to future piezometric surface maps and remedial efforts.

Comment 4. Based upon a review of the current site data, we are proposing that no additional deep wells be installed, until the full stratigraphy of the site is investigated and the location of all water bearing units is known. We believe that the installation of any wells to bedrock is premature.

In lieu of installation of deep bedrock wells, an investigation should be conducted to determine the uppermost water bearing unit below the Carmi Sand, in which it may be appropriate to install deep monitoring wells. This investigation would consist of the continuous sampling and logging of five stratigraphic soil borings (located on Figure 2) to the top of bedrock using the following procedures:

Soil samples shall be obtained using hollow stem augers advanced through the Carmi Sand until the top of the till is contacted. Drilling shall continue several feet into the till, and a temporary four-inch diameter PVC surface casing shall be set to prevent formation fluid loss into the underlying units.

Using a nominal three-inch diameter tricone rotary drill bit with pure bentonite mud drilling fluid, the drilling shall continue into the till unit. Samples shall be collected continuously using a two-

foot long by two-inch diameter split spoon driven into the till by a 140 pound hammer. A qualified geologist shall log the samples and record the blow counts. The borehole shall be terminated upon reaching bedrock.

Geotechnical samples shall be collected from the till between 10 to 15 feet beneath the Carmi Sand/till contact using a three-inch diameter Shelby tube. The geotechnical samples shall be analyzed for: vertical hydraulic conductivity, grain size, density, moisture content, porosity, cation exchange, and a laboratory description. Additional geotechnical samples for grain size (which are not required to be collected with a Shelby tube) shall be collected from any significant facies changes in the till unit. No further analytical samples should be collected from the stratigraphic soil borings.

The stratigraphic soil borings shall be abandoned using a cement and bentonite mixture delivered by a tremie pipe from borehole bottom to surface. The temporary surface casing shall also be removed and decontaminated.

The results of this soil boring investigation will then be used to determine whether the bedrock or an intermediate water bearing unit should be monitored to evaluate potential impact from the site. Based upon the results of the stratigraphic investigation and the additional shallow monitoring data, four to eight deeper monitoring wells may then be required to determine if significant downward migration of contamination through the till has occurred at the site.

Response 4. We are in agreement that stratigraphic borings be done to determine the characteristics of the glacial till layers and bedrock surface. However, we recommend that nine stratigraphic borings be placed where we originally proposed deep wells. These locations were chosen because of the significant contaminant levels found in the Phase I study. We recommend that deep wells only be installed if groundwater sampling in the aquifer at, on, in the fractured limestone bedrock surface is found to contain organic (volatile, semi-volatile) contaminants above Illinois Class I Groundwater Standards. We also have considerable stratigraphic logs from other sources in the vicinity of a number of the five stratigraphic boring locations proposed by ERM. These logs in addition to discussions with USGS personnel show that the overlying Lemont drift and Wadsworth till are aquitards with very little chance of water bearing layers. There is apt to be aquifer in fractured limestone. Therefore, stratigraphic borings will not be necessary at these locations. Collection of samples, the use of temporary casing, geotechnical sampling, and hole abandonment will be done as recommended by ERM.

Comment 5. Collecting soils samples during well installation is beneficial, however not all of the parameters listed in Table 2-3 are necessary. The SOW has identified the contaminants of concern at the site in Task 3. These compounds include polynuclear aromatic hydrocarbons (PAHs), pesticides, polychlorinated biphenols (PCBs), lead, chromium, volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), benzene, toluene, ethyl benzene, and xylene (BTEX), and cyanide. Therefore ERM recommends that these compounds, with the exception of BTEX and pesticides, be analyzed at the locations requiring additional sampling (as discussed in comment 14) to adequately define the limits of contamination. Analysis of BTEX is not warranted as the VOC scan includes the BTEX compounds. Pesticides, which are not associated with waste generated at the site, are not understood to be a potential remediation issue.

Comment 2 discussed the rationale for soil collecting samples only above the water table. We recommend that one soil sample be collected from five foot intervals at each monitoring well location from the ground surface to the water table.

Response 5. In addition to the geotechnical investigations as described by ERM for stratigraphic borings, we believe soil/waste samples for chemical analysis must be collected both above and below the water table as discussed under Comment 2. We recognize that BTEX analyses are included with VOC analyses. We believe it will be necessary to include cadmium, mercury, nickel, selenium, and zinc, since they were frequently encountered. Region V U.S.

Pesticides

EPA has requested that the full TAL list be conducted on a percentage of samples, therefore we plan to do the full TAL list on 20 percent of samples.

Comment 6. The SOW states that during the well installation process, two samples of clayey till are to be collected for falling head permeability tests. As discussed in Comment 4, we recommend that additional (a minimum of three samples) be analyzed during the Phase II Investigation to provide sufficient data.

Response 6. As a result of recommendations by ERM, IEPA, and U.S. EPA a total of six Shelby Tubes with Lab permeability tests are to be taken at the following stratigraphic locations.

SB26-B	slag area
SB27-B	slag area
SB29-B	steel finishing area
SB16-B	blast furnace area
SB31-B	coke plant area
SB32-B	steel production area

Comment 7. Due to the ground water analytical results presented in Phase I interim report and the significant amount of ground water data required to accurately assess any potential risk posed by the site, ERM agrees with the parameters for analysis listed on Table 2-4.

Response 7. Parameter list in Table 2-4 will be analyzed on groundwater samples.

Comment 8. During invasive procedures, ERM recommends that field personnel wear personal air monitors. These accurate monitors will serve to warn personnel of any health and safety problems associated with emissions, and will provide an excellent source of data for future emission calculations. Use of these monitors may also mitigate the need for future emission modeling.

Response 8. The requirement for personal air monitors as suggested has been added to the SOW. The contractor has been required to include SOP's for their use in an updated HSP.

## Task 2 - Monitoring Well Sampling

Comment 9. The SOW indicates that the 23 previously installed monitoring wells will be resampled as part of the Phase II investigation. However, the Phase I Interim Report indicates only 22 wells were sampled previously, as shown on Tables 6-1 through 6-3. This discrepancy should be clarified.

Response 9. One well (MW-03) previously installed could not be sampled.

Comment 10. The SOW states that a Teflon bailer will be used for sampling ground water and decontaminated between wells. Considering the potential for cross contamination, it would be more appropriate to use dedicated bailers.

Response 10. The contractor has now been required to use dedicated bailers.

Comment 11. Table 2-4 indicates that metals in groundwater will be analyzed for in both filtered and unfiltered samples. Unfiltered samples typically introduce a significant level of bias and ambiguity since they are more representative of the amount of fines present in the ground water, which are unrelated to an evaluation of potential ground water impact. Although the typical procedure for evaluating risk to private wells is to use a filtered sample, the site does not represent a source of potable water. All drinking water in the area is provided by the City of

Chicago, and ground water ingestion is not a realistic exposure scenario. Therefore, analysis of unfiltered samples is unnecessary.

Response 11. There is disagreement in the scientific and regulatory community on whether filtered or unfiltered samples represent true groundwater quality. We anticipate that the debate will continue and both filtered and unfiltered samples should be analyzed for metals. We agree that this is not potable Class I groundwater. It is probably Class II general use groundwater under state of Illinois criteria.

Comment 12. The existing wells screened in the till layer do not provide significant information regarding the site ground water chemistry. These wells have limited recharge and are screened in non-water bearing units. We suggest that these wells not be sampled during the Phase II activities.

Response 12. We agree that wells screened in till layer do not provide useful information regarding ground water chemistry and propose that they not be sampled or installed for Phase II.

Comment 13. Due to the proximity of the site to the Calumet River and the connection of the site to the river via groundwater, ERM recommends that consistent periodic (i.e., weekly) river elevations and ground water levels be recorded during the field phase of the Phase II Investigation.

Response 13. The Chicago District has and will continue to make weekly river and groundwater elevation level readings.

### Task 3 - Hot Spot Demarcation and Sampling

Comment 14. Task 3 is the most intensive effort in the Phase II, and presents the opportunity to provide valuable site-specific information. While a sampling program to determine the limits of remedial action cannot be completely determined without knowledge of the final cleanup standards, the following paragraphs present a proposed program to screen, and subsequently, to better define the limits of hot spot contamination.

At each soil boring location (hot spot) in which levels of contaminants were detected in the soil samples above the limits shown on Table 1 (referred to as the action limits), screening borings will be advanced in a radial pattern (i.e., north, south, east, and west) from the original soil boring. Initially, screening soil samples will be collected at locations 50 and 100 feet from the original sample location (the origin) in each of these four directions. Soil samples will be composited over a five-foot interval using a five-foot long, three-inch diameter continuous sampler. The screening boring will terminate upon reaching the water table and the borehole will then be properly abandoned with a cement and bentonite grout. Because the water table occurs at approximately ten feet below ground surface in most locations, it is expected that an average of two soil samples will be collected from each screening location. Each soil boring will be logged by a qualified geologist.

Each soil sample shall be screened for volatile organic compounds using the headspace technique and the additional parameters specified on Figures 3 and 3A and Table 2. Additional screening techniques are described below. The soil samples collected from the 50 foot radius will be screened first. If the samples from the 50 foot radius soil boring do not indicate contaminant levels above any action limit, then a screening boring at the 25 foot radius will be advanced. If the concentration in any of the 50 foot radius samples exceeds the action limit, the 100 foot radius soil samples along the appropriate axis will be screened. If the action limit is exceeded in the 100 foot radius soil boring, an additional soil boring will be advanced and sampled at a distance of 150 feet from the origin along the same radius. This procedure will continue until the edge of the hot spot zone is preliminarily established based on all of the screened soil samples exhibiting concentrations below the action levels.

In most cases the hot spots contain multiple compounds of concern. Therefore it is possible that the limit of hot spot contamination for a single compound may be different than limits of the hot spot for the other compounds.

Once the limit of hot spot contamination is reached for a specific compound, only the remaining compounds will be screened for any additional borings at that hot spot.

Soil samples will be screened using existing proven field screening techniques such as immunoassay kits, fluorescence, analysis colormetric kits, a mobil field laboratory, or by submittal to a certified laboratory for rapid analysis. Confirmatory samples will be submitted to a certified laboratory for standard SW-846 method analysis.

Once the above "hot spot" screening is completed, a grid will be established over the area. The distance between the grid lines (i.e., grid interval) will be calculated by using the appropriate formula as specified in the Instructions for the Preparation of Closure Plans for Interim Status RCRA Hazardous Waste Facilities, prepared by the Illinois Environmental Protection Agency (IEPA), Division of Land Pollution Control, dated March 2, 1989. A statistical representative number of soil samples will be collected from within the gridded area for laboratory analysis. The statistical representative number of samples will be determined using SW-846 and the actual locations of the confirmatory samples will be randomly chosen.

Response 14. We agree with the hot spot demarcation and sampling approach as presented by ERM and have incorporated this approach in our revised SOW. We have modified the ERM by expanding ERM Table 2 (Enclosure 5) to include screening parameters which our Phase I study suggests may be present at elevated levels. Since chromium and lead are pervasive throughout the site and were major constituents in the steelmaking operations, we propose that they be screened at all locations.

Comment 15. As discussed in Comment 8, ERM recommends that field personnel wear personal air monitors during invasive field procedures.

Response 15. As recommended, field personnel will be required to wear personal air monitors.

#### Task 4 - Background Sampling

Comment 16. The SOW lists this task as optional, however ERM feels that determining background soil concentrations at this time is unnecessary. The focus of the Phase II investigation is to define the hot spots which may later require remediation. Additionally, the entire site is built partly upon slag material. Therefore it will be difficult, if not impossible, to determine the location of an off-site industrial area which could provide an unbiased basis for comparison.

Response 16. It is recognized that finding the locations of off-site areas which provide an unbiased basis for comparison is difficult. Never the less, the agencies believe background conditions should be reasonably established. There is agreement that the chosen background locations should have some fill such as slag, construction debris, etc. which is characteristic of this area.

#### Task 5 - Sampling and Analysis of Water and Sediment for Conduits, Outfalls, and Storm Catch Basins

Comment 17. Collection of numerous water samples from catch basins, manholes, etc. at a site with a near surface (five to ten feet below ground surface) ground water table is difficult at best. There will most likely be considerable ground water infiltration into the conduit system. Extensive ground water quality data are already available. In addition, attempting to obtain samples from flooded underground tunnels presents serious health and safety issues. For these reasons, the task should be eliminated from the SOW.

Response 17. At the May 13 meeting, it was generally agreed that this task should be retained, although scaled back.

Comment 18. If the locations of the outfalls are known, this information should be sufficient to determine potential contaminant transport from the site. If any outfalls have yet to be identified, a study of site drawings or a site

inspection should provide this information. We suggest that all outfalls be sealed to prevent any off-site transport of ground water or sediments via this pathway. This would prevent the need for any additional sampling in these areas.

Accordingly, the tracer study as suggested in the SOW or alternate methods (i.e., video study, interviews with former employees) may be used to determine which areas are potential source areas for each outfall. These results can then be used to develop a list of potential contaminants entering each outfall branch. The various branches of the conduit system could be ranked in terms of the possible contaminant transport (e.g., lines from the coking area would have a greater priority than those from the ore yard). This ranking would then be used to determine which inlet locations (manholes, etc.) should be sealed in addition to the outfalls. If significant ponding occurs in the conduit system, it may be necessary to seal all inlets.

Response 18. At the May 13 meeting, it was agreed that outfalls should not be sealed due to creating potential hydrologic and drainage problems. Sampling of known outfalls for contaminant release will be retained in SOW, as will tracer studies. Only readily accessible conduits, manholes, etc. will be sampled.

#### Task 6 - Deep Core Sampling and Analysis from Calumet River and North and South Slips

Comment 19. The WSW site is located in a highly industrial area, and many industrial facilities (including steel mills) are located on the Calumet River. The flow of the Calumet River occasionally reverses in times of heavy precipitation, causing a smearing effect in the river sediments. Therefore, any testing conducted in the Calumet River sediments will be inconclusive as to the source of any possible contamination. We recommend that this task be eliminated from the SOW.

Response 19. It was generally agreed at the May 13 meeting that deep core sampling and analyses of sediments from Calumet River and slips will be necessary to complete remedial investigation and eventually to establish possible natural resource damage allocations. We recognize that establishing all sources of sediment contamination will be difficult. Many of the river and slip samples are to be taken at known outfalls, so as to better correlate sediment contamination with sources.

#### Task 7 - Additional TCLP Testing

Comment 20. As off-site disposal of the slag is not considered at the present time, we feel that TCLP testing of the slag is not relevant. In addition, the results of the TCLP testing conducted during the Phase I activities (included in Appendix II of the Interim Report) indicate that TCLP limits are not of particular concern. Therefore, additional TCLP testing of samples collected from precipitator foundations and sludge lagoons is not warranted.

Response 20. The agencies (IEPA, U.S. EPA) have insisted on TCLP testing of slag although COE does not believe conditions of TCLP testing is applicable to iron making slags. We do believe additional testing of precipitator foundation and sludge lagoon sludge is warranted since test results will provide guidance for early treatment/disposal of these highly contaminated residuals.

#### Task 8 - Pumping Tests

Comment 21. Although it is likely that an aquifer pumping test may be required prior to completing the design of a ground water remediation system at the site, it is premature to conduct such tests while still evaluating the site. The currently proposed investigation activities will provide significant additional data regarding the occurrence of, extent of, and recognition of contamination at the site. Once these additional data are available, the need for additional aquifer analysis may be determined.

Response 21. At the May 13 meeting, all parties agreed that pumping tests should not be performed under Phase II field investigation.

#### General Comments on the Phase II SOW:

Comment 22. Much of the evaluation of risk at the site will depend upon the amount of ground water flow entering the slips and the Calumet River from the site. Therefore, ERM recommends that more information on the construction of the sheet piling along the river (i.e., depth, materials of construction, and current condition) be acquired during the Phase II investigation.

Response 22. The Buffalo District COE is in the process of obtaining the suggested data on sheet piling.

Comment 23. The SOW indicates that many of the depths of soil samples for analysis are to be selected based on field screening for soil gases. As one of the main concerns at the site is metals contamination, this type of field screening will not effectively determine the locations of the highest probable levels of contamination. ERM suggests that soil samples be screened for appropriate indicator parameters and, as noted in Comment 2, only samples from above the water table should be submitted for laboratory analysis.

Response 23. In addition to soil gas screening for organics, we have directed the contractor to also use x-ray fluorescence screening for metals (lead, chromium) and immuno-assay or other techniques for PCB's, etc. The contractor must identify methods and associated SOP's in his work plans. As explained under Response No. 2, we believe sampling and analysis below the water table is necessary.

#### Discrepancies between the Phase I Report and the Phase II SOW

Comment 24. In Section 1.2.3, Page 1-18 of the Interim Report for the Phase I investigation, it is indicated that underground storage tanks will be investigated as part of the Phase II investigation, although this was not mentioned in the SOW. The Phase I reportedly included a magnetometer survey, the results of which may be helpful in identifying potential sources of contamination and possible areas requiring remedial action associated with underground storage tanks.

Response 24. It has been decided that UST investigation and removal is part of clean-up and will best be handled independent of Phase II RI field investigation.

Comment 25. Section 1.2.5, Page 1-26 of the Phase I Interim Report indicated that there is an aboveground storage tank currently full of fluid due to its connection with nearby liquid filled structures. ERM suggests that the contents of this aboveground storage tank be sampled to identify the contents and determine any necessary remedial actions.

Response 25. As stated in the Interim Report, these vessels which are apparently also underground to a great extent are constantly being replenished with liquid suspected as ground water from nearby interconnected old pits and foundations. We believe that testing, feasibility and clean-up is best performed as part of the recommended interim clean-up, independent of the Phase II field investigation in conjunction with UST removal.

Comment 26. Section 3.9, Page 3-32 of the Phase I Interim Report indicated that an ecological study and impact assessment is to be conducted by the U.S. Fish and Wildlife Service as part of the Phase II activities. The purpose of this is to determine the impacts of contamination levels at the WSW site to the sediments of the Calumet River and the effect of these sediments on aquatic organisms. This study is unnecessary because the entire area surrounding the WSW site is industrial in nature (the facility directly across the Calumet River from WSW is Republic Steel) and the exact source of any sediment contamination cannot be directed solely to any specific source. Therefore, any information gathered from this study may be inconclusive as to the exact source of contamination.

Response 26. The referenced ecological study has been completed by the USFWS. At the May 13 meeting, EDA stated that they would provide a copy to Navistar/ERM. This study will provide input to an ecological risk assessment which is a required part of the RI report.



Comment 27. Section 4.5.3, Page 4-167 of the Phase I Interim Report indicates that a feasibility study for ground water treatment is recommended for Phase II. There is no mention of this study in the Phase II SOW, and ERM recommends that all feasibility studies be conducted after the Phase II investigation, to ensure that all applicable data are considered.

Response 27. The recommended feasibility studies for groundwater treatment, pit and foundation sediments, etc, are not part of the Phase II field investigation.

Comment 28. There were numerous indications in the Phase I Interim Report that risk evaluations are to be conducted as part of the Phase II Investigations. ERM recommends that all risk analysis be conducted after the Phase II Investigation to ensure that all applicable data are considered in the assessment.

Response 28. We recommend that the risk assessment (RA) be started during the Phase II investigation as a parallel task. There is a great deal of information and data available from the Phase I study and historical records which will facilitate the initial work required for a risk assessment. It is intended that all of the additional data and information from the Phase II investigation also become inputs to the RA. Therefore, the RA will not be finalized until after the Phase II investigation.

**WISCONSIN STEEL WORKS SITE  
PROJECT # 04015.23  
COMMENTS ON USACE PROPOSED  
MONITORING WELL LOCATIONS**

During a meeting with the U.S. Army Corp. of Engineers (USACE - Buffalo), we were asked to comment on proposed monitoring well locations at the Wisconsin Steel Works Site (WSW) in Chicago, Illinois. The USACE requested that these comments be completed by mid-January, 1994, prior to their preparation of a Phase II Work Statement for contractor quotations.

Our technical review of the "Site Characterization Interim Report (9/93)" was completed on November 4, 1993. Among the chief concerns addressed within the comments were the following:

- Characterization/Investigation of LNAPLs via water table monitoring wells. (No water table wells have been completed on the site. Nonetheless, free-floating petroleum product appears to have been observed in several monitoring wells, including MW-5 and MW-19.)
- Investigation of the site-specific stratigraphy beneath the Wadsworth Till as well as sampling and analysis of these deeper geologic units possible DNAPL contamination (especially in the vicinity of the former Coke Plant - Area II).

In response to the above comments, the USACE has proposed the installation of six Carmi Sand monitoring wells (all of which we assume will be water table wells) and eight deep monitoring wells set on the "top of rock" (assumed to mean above the bedrock), existing 50 to 80 feet below land surface based on the Interim Report.

The USACE's monitoring well proposal included a 4-page submittal with a brief rationale for each monitoring well location. In general, their proposal does address the two concerns listed above.

**CHARACTERIZATION/INVESTIGATION OF LNAPLS**

We concur with the location of shallow wells proposed as MW26A, MW27A, MW29A, and MW30A.

Proposed monitoring wells MW-31A and MW-32A appear to be located very close to previously-installed MW-5 and MW-19 where free-floating product is suspected. We recommend that in addition to MW31A a water table well be placed very near MW19 and a second well be placed to the east toward SB01. These additional wells will provide better local hydraulic information and will be useful in determining the potential extent of any LNAPL. Well MW32A should be installed within 25 feet of MW5 to assess the potential for LNAPL.

We also recommend that an additional water-table monitoring well, each, be installed in the vicinity of SB-17 in the slag area, MW-28 (a proposed deep monitoring well), MW-16B (unless the USACE can confirm that existing MW-16 is a water table monitoring well), and west of MW20 near the property boundary.

In brief, we recommend that a total of 12 water table monitoring wells be installed, rather than the proposed six monitoring wells.

## INVESTIGATION BENEATH THE WADSWORTH TILL

We request that the SOP for the investigation of units beneath the Wadsworth Till be submitted for review before the investigation is authorized. Our chief concern regarding the sampling and analysis of these deeper geologic units is the possibility of cross-contamination via the bore-hole conduit. If contamination is observed in the surficial units, then double-casing of the deeper monitoring wells, or its equivalent, may be necessary to prevent such cross-contamination.

If ground water is not observed on "Top of Rock" then the deep wells should be set in any perched zone below the Wadsworth Till. The boring for the well should penetrate to bedrock to determine depth and the condition of the bedrock surface (lithology, fracture, etc.).

In brief, we concur with the USACE's proposed deep monitoring well locations, and we anticipate that eight such wells are sufficient for this stage of the investigation.